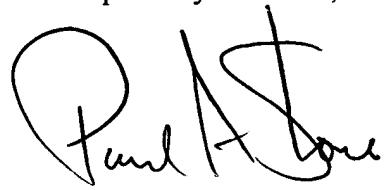


Respectfully submitted,



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PARALLEL FLOW PROCESS OPTIMIZATION REACTOR

[0001] The present invention is related to, and claims priority to co-owned, co-pending
5 U.S. patent application Ser. No. 60/187,566 entitled "Apparatus and Methods for Multi-
Variable Optimization of Reaction Systems and Other Chemical Processing
Microsystems", filed March 7, 2000 by Bergh *et al.*, and to co-owned, co-pending U.S.
patent application Ser. No. 60/229,984 entitled "Apparatus and Methods for Optimization
of Process Variables in Reaction Systems and Other Chemical Processing Systems", filed
10 September 2, 2001 by Bergh *et al.*

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BACKGROUND OF INVENTION

OFFICE OF PETITIONS

15 [0002] The present invention generally relates to materials science research, and
specifically, to combinatorial (*i.e.*, high throughput) materials science research directed
toward the identification and/or optimization of new materials. The invention
particularly relates, in preferred embodiments, to apparatus and methods for optimizing
chemical reaction systems, such as chemical reaction systems involving heterogeneous
20 catalysts.

[0003] In recent years, significant efforts have been extended toward developing parallel
systems, such as parallel reactors, for the purpose of screening different materials, such as
heterogeneous catalysts, for particular properties of interest, such as catalysis. U.S.
Patent No. 5,985,356 to Schultz *et al.* discloses synthesis and screening arrays of
25 materials in parallel for catalysis, and U.S. Patent No. 6,063,633 to Willson discloses
parallel flow reactors, and parallel screening techniques (*e.g.*, thermography,
chromatography, *etc.*) for evaluating catalysis. A substantial portion of such effort has,
however, focussed on apparatus and methods for evaluating compositional space of the
materials (*e.g.*, heterogeneous catalysts) of interest, while only a relatively small portion
30 of such effort has been directed toward apparatus and methods for evaluating other
parameter spaces – in addition to compositional space. More specifically for example, in
the context of heterogeneous catalysis research, only limited attention has been focused
on the development of apparatus and methods for high-throughput, parallel optimization